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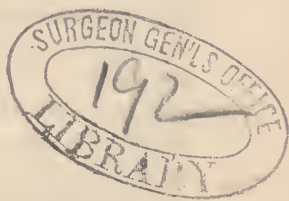
# VACCINATION;

ITS

## USES AND ALLEGED DANGERS.

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*Read before the Philadelphia Branch of the American Social  
Science Association.*

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## VACCINATION; ITS USES AND ALLEGED DANGERS.

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IN the official announcement of the meetings of the Social Science Association it was stated that I would read a paper upon "The Uses and Abuses of Medical Charities," in March next, but it being inconvenient for the gentleman who was to address you this evening to be here, I have taken his place. At the suggestion of the chairman of the Committee on Public Health I have also changed my subject, an alteration which has not seemed inappropriate, on account of the fearful epidemic of small-pox which is now prevailing in our midst. This has swelled our mortality to enormous proportions—jeopardized the lives of a large number of our citizens, spread fear and sorrow throughout the community, cost the city thousands of dollars, and injured business more, probably, than the general public is aware.

In the middle of September, 1871, it first began to be apparent that the disease was on the increase, and that the grave suspicion which physicians had for some time entertained that it was about to become epidemic, would soon be realized. As has been usual with other epidemic diseases, this found our health authorities totally unprepared for its reception, and to-night we can look back over a long array of broken home circles, and sum up our bitter experience—an experience which is the more distressing because a large number of the lives lost were sacrifices on the altars of mismanagement, prejudice and ignorance.

During the last century, and before the introduction of vaccination, about thirty-five per cent. of all those stricken with small-pox perished. It is asserted by Dr. Welch, physician to the Municipal Hospital, in the number of the *Philadelphia Medical Times* which I received to-day, that during the present epidemic about twenty-one per cent. of all the reported cases have been fatal. This mortality, with our present means of protection, is too high by at least fifteen per cent.; for, as we are now able to

modify it, small-pox is one of those affections which is almost under human control, and a majority of the lives lost by it are wanton sacrifices for which the public authorities should be held publicly responsible. We do not hesitate to say that we think that the grand conception of the immortal Jenner, that the disease might be stamped from the face of the earth, was not so far wide of the truth as his opponents would have had us believe.

If we survey the sickening record of mortality for Philadelphia during the past four months, we find that, while during the week ending September 9, 1871, only one death occurred from variola, those from the same cause during the week ending December 2, 1871, had reached the fearful number of two hundred and thirty-three persons. Yet we find some of the public papers, even after this, disclaiming that there was any cause for serious alarm in the community. That more than two hundred human beings died of small-pox in Philadelphia in one week, now when we are on the threshold of the twentieth century, is a startling fact, and furnishes a strange commentary upon our progress in learning and civilization; but it is a still more startling fact that the public press, and the city authorities, who ever profess to have the public good at heart, should have deemed this but a slight cause for alarm. That between the 1st day of September, 1871, and the 18th of January, 1872, 2,086 persons died of a strictly preventible disease, in this enlightened city, and that this was nothing remarkable, according to the sanitary gospel of certain commercial authorities, is something which physicians and other scientific men cannot appreciate. Truly the estimated value of human life is a very low one, when it can be thus quietly summed up in dollars and cents by commercial authorities and miserly money-changers. What a dark commentary on our boasted humanity we present—what a sordid testimony to human avarice we furnish—what an unenviable example we hold up to the civilized world! Certainly the republic but lightly estimates the value of its citizens!

Let us for a moment contrast the epidemic in Philadelphia with that in London. During the week ending October 29, 1870, according to the record of mortality published by the *Medical Times and Gazette*, twenty-one persons died of small-pox in the

latter city. From this time it gradually increased until the week ending May 6, 1871, when the death-rate from the disease had reached its acme, two hundred and eighty-eight persons having perished from it during the previous seven days. This is only fifty-five in excess of the highest weekly mortality of Philadelphia, while our population is only 674,000, and that of London is about 3,251,804, or nearly five times ours. But this mortality from variola alarmed all London, and citizens and municipal authorities united to quell the epidemic. The public money was freely expended—new hospitals were erected, additional relieving officers and sanitary inspectors were appointed, extra vaccine and poor physicians were called into active service, and the public carefully vaccinated.

Of the various measures for the prevention or arrest of this disease, the one which most interests us to-night is vaccination. The history of this is one of the most interesting and remarkable subjects in medical literature, and it may not be amiss to refer to it in this place. The name which is indissolubly associated with it is that of Jenner, but there is another which with his should become a household word.

In the churchyard at Yetminster, in Dorsetshire, England, is a tombstone on which is the following inscription: "Sacred to the memory of Benjamin Jesty, who departed this life on the 16th of April, 1816, aged 79 years. He was born at Yetminster in this county, and was an upright, honest man, particularly noticed for having been the first person (known) who introduced cow-pox by inoculation; and who from great strength of mind made an experiment from the cow on his wife and two sons, in the year 1774." Jesty was a farmer in Gloucestershire, England, and Mr. Haviland says, that if we may believe the portraits of him, he was a good specimen of an English yeoman. In 1805, he made good his claim to having been the first person who performed this experiment before the medical officers of the Original vaccine pock institution at London, and at the same time "Mr. Robert Jesty, very willingly submitted publicly to inoculation for the small-pox in the most vigorous manner, and Mr. Jesty was also subjected to the trial of inoculation for cow-pox, after the most efficacious mode, without either of them being infected." Mr. Jesty seems to have been a man of peculiar mental power, for he performed

this operation without a precedent, having come to a knowledge of the fact that cow-pox inoculated into the human subject, would prevent small-pox in the same manner that Jenner did. (*Lancet*, September 13th, 1862).

The recognition and acknowledgment of Jesty's part in the discovery of vaccination does not lessen the debt of gratitude due to Jenner; for he, without any knowledge of the labors of his fellow-countryman, conceived the same great idea, and it was through him that it came into general use. While an obscure apprentice to a surgeon, at Sodbury, near Bristol, England, he heard the common report among the people that cow-pox inoculation on the hand would prevent small-pox; and at this time he seems to have got his first glimpse of the great truth. A little later, when apprenticed to the famous John Hunter, in London, he mentioned his conviction to him, but the great master scouted at the immature idea of his now immortal pupil, so that it was not until the 14th of May, 1796, just twenty-two years after Jesty vaccinated his wife and two sons, that Jenner was able to perform his first experiment. If Seaton is correct, however, this was thirty years after he first conceived the idea at Sodbury, when a young country woman told him, that she could not take small-pox, "for she had had cow-pox." What weary waiting it must have been, during these thirty years, and with what intense anxiety he must at last have watched the result of his experiment! With the point of his lancet he that day carved for himself a never-dying fame, and with the flow of those few drops of warm life-blood he had given to the world a rich legacy, the discovery of which was the result of no happy accident, but followed one of the best examples of inductive reasoning with which the history of medical science furnishes us. Thousands and tens of thousands of persons now live, whose presence on earth this day is due to his discovery, and it may be, and no doubt is, true that many of you who are now listening to me have only lately received a new lease of your lives through the boon which he has given us.

Jenner's first publication of his experiment was made in 1798, after which vaccination gradually came into general use, and the practice of inoculation was discontinued. In 1841 the latter was forbidden by law in England, and in 1852 vaccination was made

compulsory. Late English journals say that it is now proposed to raise some monument, to commemorate his discovery, at the church which is near his birth-place; but a better and more enduring epitaph has been engraved with the point of the lancet, upon the arms of countless happy children, strong men and fair women.

In discussing the various questions relating to vaccination it is desirable, in a popular discourse like this, to treat only of those things about which the best authorities in medicine are entirely decided, and those about which the public entertain some unfounded prejudices. We shall endeavor to thus limit ourselves in the sequel, premising that we shall attempt to promulgate no new views, but rather to present a summary of what is really known in regard to the subject.

Jenner taught that the cow-pox, a peculiar disease in the horse, and the small-pox in the human subject, were one. . He seems to have thought that man derived the disease from the horse or cow, and that in his system the virus had undergone some inscrutable change by which it had acquired a malignant form, which causes it to produce the devastation that we have so lately witnessed in our own community. Whatever may have been the origin of variola in the human family, whether man derived it long since from the inferior animals or they from him, there seems to be but little doubt—a statement to which Seaton and Ballard, in their respective works on vaccination, lend their authority—that the equine, the bovine and the human disease have their origin in one and the same specific virus. Jenner was wrong, however, in supposing that the matter taken from the “grease” in horses would protect the human subject from small-pox when he had been inoculated with it. The horse suffers from a peculiar affection which should be called equine variola, and it is the lymph taken from this which will produce genuine vaccine disease in man, and cow-pox in cows, which, in its turn, can be transmitted to the human subject in whom it will prove protective.

For a long time it was doubtful whether variolous matter taken from the human subject and inoculated into the cow, would produce variola or genuine cow-pox. French authorities asserted the former, and Trousseau, even in the last edition of his works, warns

against the use of such matter, because he says it produces true small-pox.

Seaton, however, has pointed out the fallacy of the experiments of Chanveau and other French investigators, upon which these statements were based, while Gassner, in Germany, Ceely and Badcock, in England, in 1839 and 1840, and Adams and Putnam, in America, in 1852, proved by direct experiment that small-pox virus will produce cow-pox when cows are inoculated with it. They all proved likewise that when the lymph thus generated was inserted into the human subject, it produced, not variola, but vaccine disease with its protective influence. Large numbers of persons have been vaccinated in England, with lymph of this kind. Seaton says that Mr. Badcock alone has performed more than 20,000 vaccinations with it. This is an important fact, when we remember that comparatively few American physicians have any practical knowledge of bovine variola, and that Trousseau, unacquainted with the English experiments just mentioned, denies entirely that true bovine variola, can be generated by the inoculation of small-pox virus into the cow.

It will be noticed that there are some very important differences between the equine and the bovine and the human variolæ. The last is an eminently contagious disease. It may be transmitted from one patient to another not only by inoculation, but also by the inhalation of its specific effluvia, or as it is commonly called, by contagion. Thus generated it always produces a disease like itself, with a general eruption, and transmissible through the same channels. It may be given to the cow by the emanations from the human subject. Ceely saw it thus transmitted by accident in 1840, and ten years before that time Sonderland, of Barmen, obtained the same result by direct experiment. He enveloped the cattle in blankets taken from the beds of variolous patients. In these cases, however, the cows were not affected with a general, but with a local disease, the ordinary bovine variola.

On the other hand, horse or cow-pox is not transmissible from one animal to another by contagion, but only by inoculation, and only through the same channel can man receive it from the lower animals. Moreover, in kine it never produces a contagious affection, but retaining its true bovine or equine character, it is only transmissible from one individual to another by inoculation.

We have, therefore, three channels through which members of the human family may receive vaccine disease. These are, first, from the horse, second, from the cow, and third, from the human subject, by the transmission of virus which was humanized at the time Jenner commenced his experiments, or at various periods since that time. The first two of these sources may be discussed together. It is so rarely that any one attempts to obtain or use the lymph derived from the horse, that the consideration of its peculiarities is a matter of very little importance. Popular prejudice, which, for want of proper knowledge, has been too much fostered by some members of the medical profession, has made the community look to a supply of bovine virus as affording additional and more certain protection against the infection of human variola. In determining the truth in regard to this matter, it is to be remembered that the transmission of any specific or zymotic disease from an animal of one species to an animal of another species, is a matter of considerable difficulty, and that, though the individual receiving the virus may be susceptible to its influence, it may have to be inoculated several times before it produces its effects. The early investigators of this subject experienced great difficulty in transmitting the equine disease to the cow, and this aside from the uncertainty whether they had obtained good lymph or not. So Ceely, Badcock, and others, witnessed many failures in their attempts to produce cow-pox by inoculation of variolous matter. In accordance with the same law the transmission of the cow-pox to man is by no means certain. The inoculation frequently fails. Ceely was successful in only about fifty per cent. of his cases, and M. Husson in only a little over sixty-two per cent. Moreover, success which is not entirely complete—and such an expression may be legitimately employed—is more common after the inoculation of bovine than of human vaccine virus.

When the present epidemic made its appearance in Philadelphia, it found the public unsupplied with the necessary quantity of reliable vaccine matter. The profession naturally turned to the cow for a fresh supply, a suggestion which met with a most hearty response in the community. It was not long until many persons, partly because they deemed the protective power of bovine variola greater than that of human vaccine disease, and partly from the ignorance and cupidity of the homeopathic school

of physicians, were demanding that they be vaccinated with no other material, not knowing the uncertainty of bovine inoculation.

Shortly after the epidemic appeared here, bovine virus of three kinds could be obtained in the city. One was a foreign article, and utterly worthless; the others were furnished from Boston and New York. The speaker tried them all, and was fairly successful with the Boston virus, but failed with the New York, though the fairest promises were made at the time of its introduction. I am assured by other physicians that they have had the same experience with it.

The difficulty in transmitting it, and the uncertainty in the action of the cow-pox, may very justly be urged against its substitution for humanized virus. We do not hesitate to say, that had we been exposed to the contagion of variola without having been protected, we would elect to be vaccinated with good ordinary vaccine matter, in preference to that which is derived from the cow or horse. It may further be urged against the introduction of bovine lymph that it is very severe in its action. While the sorest arms which the writer has ever seen, have been produced by humanized virus, there seems to be no reason to doubt the statements of authors that the results of cow-pox inoculation are much more severe than ordinary vaccine disease. These objections are not counterbalanced by the dangers which attend the use of the ordinary virus.

Humanized lymph presents many striking peculiarities. After bovine virus has been transmitted through the systems of several members of the human family, it becomes much milder in its effects and much more certain in its results, without having lost any of its specific qualities. This modification is a very strange one. Marson, of England, a high authority on vaccination, says that with good human virus, and after exercising all due care that the vaccinator should not be unsuccessful in more than one in every 170 operations, and that no one should fail oftener than once in every 150 insertions. Of this Seaton says: "We may fairly adopt Marson's rate as the standard below which no vaccinator, vaccinating from arm to arm, has any right to be satisfied with his performances." This of course applies only to primary vaccinations, to which we have as yet entirely confined our remarks.

Contrast these results with those obtained by direct inoculation from the cow to man, in which with due care and though performed by experienced vaccinators, nearly one-eighth of the insertions have proved unsuccessful.

They may also be contrasted with the results of vaccination by some members of the medical profession. Many are satisfied with successes which are quite inferior to these, and though I have no means of proving what I say, I firmly believe that taking the community at large the failures amount to one in fifty instead of one in 150. Among many this is far under the truth, for not a few physicians are satisfied with one failure in twenty, or even one in ten, while a few think they have done well if they fail but once in five cases.

The amount of ignorance in regard to vaccination is truly surprising. Every grandmother thinks herself fully competent to perform it, as well as to select the lymph with which it is to be done, and some physicians look upon it, fraught as it is with so much of good or evil, as a very trivial matter. The result is that the operation is often so imperfectly done that only partial or no protection is afforded the vaccinated.

The general public and the medical profession have at various times earnestly discussed the assertion that vaccine matter has been diluted, or has lost some of its virtues, by transmission through many individuals of the human family. The affirmative side of the question has had many advocates, but the position can neither be supported by argument nor clinical experience. We must look upon the virus of vaccine disease as a specific substance, the nature of which cannot be altered. It would be strange indeed if this were not true, for if it were not, vaccine would form an exception to the laws which govern all diseases of its class. Who ever heard of the peculiar poison of scarlet fever, measles, typhus fever, or even variola itself, being modified by being passed through the systems of human beings? It is true that at certain times and under certain circumstances these diseases differ materially, but the difference is one of degree more than one of kind. So it is with vaccine matter. In its passage from the cow to man it undergoes certain changes, which have already been mentioned, so that it becomes more mild and much more certain in its action. It is this which constitutes the process of humanization, if one

may so express himself, but through this it never loses any of its specific qualities and if the selections have been good and the transmission perfect, the vaccine disease produced to-day by the matter started by Jenner affords just as perfect protection as that produced by virus obtained directly from the horse or the cow.

It will be observed that this statement is made with much qualification, when it is said, the selection of the virus has been judicious and the succession perfect. Vaccine disease, it is to be remembered, is not an affection which is incident to the human family, but it is always acquired, and hence so good an authority as Marson says that its course in man is more easily interfered with than that of disorders which are peculiar to him. This statement is corroborated by general experience, but the cause is a very different matter. There is a very important difference between a loss of protective power which arises from a mere dilution of the virus or its degeneration from transmission through the systems of many members of the human family, and an alteration or deterioration of its properties by subjects who are unfit to transmit the disease and to furnish lymph.

In 1853 Mr. Marson directed professional attention to the fact that in a large number of the vaccinations done in England, the operation was unskillfully performed. The subject was deemed so important that it very shortly afterward claimed official attention, and the medical department of the Privy Council was directed to inquire into the truth of these allegations. They fully supported the statements of Marson, and I have no doubt whatever that his strictures apply just as forcibly to Philadelphia as they do to London, since the general opinion that the operation requires little care and less skill, has become so prevalent. But it does require some skill, much care and nicety of touch, and great judgment in the selection of virus. It is one which only a thoroughly educated physician ought to perform, and one which he is only qualified to perform after some special study and investigation. That this is true, is proved by the fact that during the present epidemic, physicians have met with many young children said to have been vaccinated and protected from small-pox, who presented very imperfect marks or none at all, and in whom upon vaccination the disease ran a nearly regular course. The speaker has met with numerous instances of this kind, and he

cannot believe that his experience has been peculiar and in any way different from that of his professional brethren.

No doubt many of you have marveled at the mortality of the present epidemic of small-pox, and that many of you, skeptical in regard to its merits before, have been ready to cry out against the whole system of vaccination. We beg you not to be too fast here. What has just been said in regard to improperly selected virus and unskillful performance of the operation must be duly considered in estimating the value of vaccination.

It is no doubt true that Jenner and his immediate followers claimed too much for it, and thus brought some discredit upon the operation, but the speaker is convinced that the want of knowledge, which is so lamentably present in later times, has done much more to destroy the confidence of the public in its efficiency.

Jenner believed that the protection of vaccination was as complete as that afforded by small-pox, provided (and this it is very important to remember) it had been properly performed. It is not to be forgotten that he never claimed this protection to be absolute, for so much cannot be said of variola itself. Numerous instances, and fatal ones, too, of second and even third and fourth attacks of the disease are upon record.

It must be remembered that in order to test this question and to settle it beyond dispute, it will be necessary to determine not how many among a given number of vaccinated persons contracted small-pox, but how many among a given number of those who were exposed to it were affected; and not only this, but it may be added that it is not how many who have been vaccinated, but how many who have been *thoroughly and properly* vaccinated and exposed, have been taken ill. This is a question which it will be difficult to decide, but it is at the foundation of all our knowledge upon this subject, and when it comes to be fully and correctly replied to, the speaker has but little doubt that Jenner will be found to have been nearly correct. The lack of faith in vaccination, whether in the medical profession or among the laity, comes only from want of knowledge or imperfect observation, and if any physician finds a considerable number of persons whom he has vaccinated stricken with a serious form of the disease, he may be sure that he has erred either in selecting or inserting the lymph.

We, here in Philadelphia, are to-night paying the penalty of

public and individual carelessness in regard to this matter, and a fearful tribute indeed has been demanded of us. That this is true is proven beyond all question by innumerable statistics. First is the fact already mentioned that, before the introduction of vaccination, about 35 per cent. of all persons attacked by variola died, a mortality which continues among the unvaccinated to this day, while among those who have had the benefit of the operation the death rate for unselected cases has fallen to about five per cent. National statistics as furnished by Seaton prove the same fact. Before the discovery of vaccination the annual death rate from small-pox in Sweden was 2,050 out of every million of the population. During the forty years which ended with 1850, it had fallen to 158. In Westphalia, where it was 2,643 in a million, it has fallen to 114; in Berlin, from 3,422 to 176, and in London from 3,000 to 200. If this is true, with all the imperfections in the manner in which vaccination is done, we can hope for much more when it is properly performed.

The statistics of the British army prove this. Before the discovery of Jenner, small-pox was sufficient to destroy an army, and to drive the vessels of a navy from the seas. In 1858 the British government made it obligatory that every recruit entering the army should be thoroughly vaccinated and revaccinated. The result has been that in the six years ending with 1864, the annual number of cases of small-pox per 10,000 of mean strength has only amounted to 14, while the annual death rate per 10,000 soldiers has only reached to 0.84. Thus the results among these specially protected classes of the community form one of the strongest arguments in favor of vaccination.

The degree of protection varies much with the manner in which the vaccination is done, and especially with the number of insertions that are made. I am particular about insisting upon this point, because I have met with many mothers who strongly objected to more than one, and at most two, insertions being made. I have more than once had them positively refuse to allow me to make more than one puncture. The experience of all authoritative medical men is that the degree of protection is up to a certain point just in proportion to the number of successful insertions of vaccine matter. Four or more genuine vesicles afford almost absolute protection. No child should be vaccinated in less than

four places, and in the performance of this operation no physician should allow himself to be influenced by parental sympathies. Mr. Simon, as quoted by Aitken, has thus tabulated the results of his observations on this point, extending over a period of twenty years, during which time 6,000 cases of post vaccinal small-pox came under his observation.

|   |   |      |                            |
|---|---|------|----------------------------|
| Class I.—Stated to have been vaccinated but having no |   | died | 21 $\frac{3}{8}$ per cent. |
| cicatrix.....   | “ | “    | “                          |
| “ II.—Having one vaccine cicatrix.....                | “ | “    | 7 $\frac{1}{2}$ “          |
| “ III. “ two “ cicatrices.....                        | “ | “    | 4 $\frac{1}{8}$ “          |
| “ IV. “ three “ “.....                                | “ | “    | 1 $\frac{3}{4}$ “          |
| “ V. “ four or more “.....                            | “ | “    | $\frac{3}{4}$ “            |
| Unvaccinated.....                                     |   | “    | 35 $\frac{1}{2}$ “         |

It may, therefore, be confidently asserted that that vaccination is the most efficient which produces the largest number of the best cicatrices.

Jenner taught that a person who had once taken cow-pox could not contract it again, and that, as it was essentially variola, he would remain protected from that affection. According to Jenner, therefore, revaccination is not necessary, providing the first insertion was thoroughly and effectually made. This is nearer the truth than the general public supposes. One constantly meets with persons who cannot be made to take vaccine disease a second time, but this is not the rule. Most persons will have a sore arm twice in their lives—during infancy, and immediately after the fourteenth or fifteenth year. Infants are, probably, as susceptible to the contagion of variola as they are to that of any other of the diseases of its class. In late childhood the susceptibility seems to be somewhat diminished, to be increased again after the fifteenth year, and as persons manifest a stronger disposition to take variola from this until the twenty-fifth year, for the same reason they evince an increased susceptibility to vaccine disease during this period. This is not because there is any disposition for the influence of vaccination to wear out in a given time. The popular idea that its effects are exhausted, and have to be renewed every seven years, is unsupported by any facts whatever.

It may be concluded that revaccination is important in the highest degree, and that it should never be omitted after the fifteenth year of life. As it can do no harm, and may do much good, it

should be repeated whenever an epidemic occurs; but if the vaccination and the revaccination have been *thoroughly and efficiently* done, this is less important than most persons suppose.

During the present outbreak of variola the community has manifested much ignorance in regard to this subject. Many seemed to suppose that if one vaccination was useful, several, repeated at intervals, would afford them additional protection. During the last few weeks the speaker has been repeatedly called upon to perform the operation for persons who had, at the very time progressing, though modified vaccine disease. These insisted upon being vaccinated. There are many others who somewhat exultingly tell that they have been vaccinated five, six, or even more than twelve, times before they had sore arms. Such persons have subjected themselves to great anxiety, much trouble and some expense, without having gained for themselves any additional protection. If a person has been perfectly vaccinated in infancy and perfectly revaccinated after puberty, and if after this, two, or at most three, perfect attempts made during an epidemic fail to produce any effect, he need give himself no uneasiness, for he can obtain for himself no additional security.

Because a person has a sore arm after ten or a dozen ineffectual attempts at vaccination he does not necessarily derive any benefit from it, even though the vaccine disease run a nearly regular course. Most persons may be made to have a sore arm if the attempts are systematically made and continued long enough. This is proved by the following facts. The *Société de Médecine*, of Marseilles, estimates that one per cent. of the whole of the variolated portion of the population will have small-pox a second time; and, according to Seaton, one per cent. of the admissions to the small-pox hospital of London have been persons with a second attack. This standard is, at least, near enough to the truth for comparison.

Army statistics furnish us much information in regard to the effects of revaccination on persons who have had the small-pox. In the Wurtemberg army, from 1831 to '35, 319.5, out of every 1,000 soldiers who presented marks of variola took vaccine disease "*perfectly*." In the British army, in 1861, 451.4, of every 1,000 such persons took "*perfectly*." To say that all these were liable to contract small-pox, is simply absurd. So with revaccination—if

the attempts are persisted in, a sore arm may be obtained, but as in many of those who have already had small-pox, it will afford no additional protection.

It is necessary to consider the objections to vaccination with some care. It is asserted that it is injurious to inoculate such a potent poison into the blood. This objection has no foundation whatever. It has been shown that equine, bovine and human variolæ are one. If unprotected, every member of the human family is as liable to have small-pox as he is to have measles, scarlet fever or any other of the eruptive diseases, and probably even more so. If he can receive one of the subtlest and most fatal of all poisons in a modified and much milder form, as he undoubtedly can by means of vaccination, he is silly indeed if he does not accept with a grateful heart the priceless boon with which science has furnished him.

Vaccination is said to have increased the mortality from other diseases. There are no recorded facts which prove the truth of this assertion, but, on the contrary, in those countries where vaccination is most generally resorted to and most thoroughly performed, the total of human mortality has diminished and not increased. It is an old observation that scrofula and consumption frequently follow small-pox, and the experience of the last seventy years has demonstrated beyond dispute that persons may often be saved from these and kindred diseases by preventing variola. From 1755 to 1775 the general death rate in Sweden was 289 per 10,000 of the population. From 1841 to 1850 it was only 205. In London, at the middle of the last century, 355 out of every 10,000 persons died annually, and from *all diseases except small-pox* 325. *Including small-pox* the death rate at the middle of the present century was 249 (Seaton). It is said that other diseases may be inoculated with vaccine matter. Prominent among the affections which it is alleged may be thus transmitted are certain cutaneous affections, scrofula and syphilis. These will be separately considered.

The medical profession has never entertained the opinion that cutaneous diseases can be communicated in this way. The complaints of parents that this has occurred are numerous, arising, as Marson says, chiefly from their unwillingness "to believe that there is anything wrong with their offspring; and when

other diseases follow, vaccination gets blame for what is really and truly due to other causes." Seaton, who has carefully examined many such cases, writes, "I have never yet in a single instance found that the child from whom the lymph was taken was suffering from the disease which it was said to have imparted." Marson, after an experience in 40,000 vaccination, West after 26,000, and Sir William Jenner after more than 13,000, bear the same testimony, employing the strongest terms in committing themselves to the doctrine.

It is unnecessary to say any more in regard to the transmission of scrofula by vaccination. It has been shown that instead of increasing this operation has diminished the tendency to that disease and to pulmonary consumption.

I have now reached that stage in my discourse which must be most delicately handled; but the transmission of syphilis by vaccination is so closely connected with the public good, while the ravages of the disease are so terrible and revolting, that I feel that I would be derelict in my duty if I passed it in silence.

In considering the question it must be remembered that both this and vaccinia are inoculable affections, and that, excepting when the former is hereditary, it cannot be acquired in any other way. They both result from specific poisons, the action of which is governed by laws to which there are but few exceptions as to time of incubation and the course which they run. The latter is very definite in all diseases of this class, and if two poisons are received into the system, the action of one rarely interferes with that of the other. For example, take vaccine disease and unmodified small-pox. They have been made to run their course in the same subject, and persons suffering from small-pox have at the same time presented perfect vaccine vesicles. The lymph taken from these has been used to vaccinate healthy children. It does not produce small-pox, or a hybrid of small-pox and vaccinia, but simple and uncomplicated vaccine disease, with its protective influence. Such virus would not, of course, be selected by the careful physician; but it may be used with perfect safety, provided it is not accidentally mixed with the lymph of the variolous vesicles which are at its side. Is it any more reasonable to suppose that syphilis can be thus transmitted than the still more subtle virus, variola?

Besides this and other theoretical objections, the results of a large experience support the opinion that this disease is rarely transmitted in vaccination. For now, nearly three-quarters of a century, vaccination has been going on in every part of the civilized world, and millions of persons have been protected by its marvelous influence. Certainly sufficient experience has been gathered in all this time to enable physicians to speak with some authority upon this point, and the great mass of them waive entirely the importance of this objection. In 1868 Seaton and Ballard, in their respective works on vaccination, carefully analyzed all the cases which had at that time been reported in which syphilis was said to have been received by vaccination. With a few exceptions they found that they could not bear the test of critical examination.

It must be admitted, however, that the two affections have been transmitted to the same persons at the same time, but it must be remembered that most of these were the consequence of carelessness. The direct experiment of transmitting the disease by using the variolous lymph from syphilitic patients was tried during the time when inoculation was in vogue, and has been repeated with vaccine lymph since Jenner's discovery, and in both instances failed. I think we may therefore conclude that the danger of inoculating syphilis in vaccination is almost wanting, and that it is at least so small that it cannot be used as an argument against vaccination. The usefulness of the latter certainly much more than counterbalances the dangers of the former.

In this brief resumé of the knowledge which we possess in regard to vaccination, we have not attempted to advance any original ideas, but rather to present the conclusions which may be drawn from collected facts. Having shown that the protective power of vaccination is as potent as it ever was, let us inquire why Philadelphia and other cities have been so recently devastated by an epidemic of variola. We shall use London and Philadelphia for comparison, for the simple reason that the statistics of the epidemic have been pretty fully worked up in the former city, while at home we have all watched the progress of the disease from its origin until the present time.

In considering this it must be remembered that since 1853 vaccination has been compulsory in England. In London, during the

third quarter of the year 1870, the weekly mortality from small-pox varied from nine to fifteen. From this time it gradually increased until May 6th, 1871, when the mortality had reached its highest point, 288 persons having died from it during the week ending on that day. From October 1870, to December, 1871, more than 7,500 persons perished from the disease in that city. Two important causes operated to produce the result: 1. A popular prejudice against vaccination, which has become so strong in England that "anti-vaccination leagues" have been organized for the avowed purpose of resisting the law. 2. The indifference of the authorities in regard to the execution of the law for compulsory vaccination. In many of the parishes of London it is asserted that no attention had been given to the matter for some time on account of the trouble necessary to be taken to secure efficient working under the act, and on account of the expense necessarily entailed by general and systematic vaccination.

When the small-pox appeared in London the authorities immediately went to work, and the *Medical Times and Gazette* for February 4th, 1871—a journal not given to praising municipal officers—asserts that "it may honestly be said that never was an epidemic disease met more worthily." When the outbreak occurred it found the city with a small-pox hospital capable of receiving one hundred patients.

In a very short time they had provided accommodations for at least two thousand. When the epidemic appeared we could provide for about one hundred and fifty persons in our municipal hospital. We have now accommodations for double that number, with a weekly mortality nearly equal to that of London, and with every prospect of the disease continuing for a long time. It is probably true that the condition of the poorer classes of this country makes it unnecessary to remove them from their houses so frequently as abroad, but there can be but little doubt that the health of our community has been greatly jeopardized, and the disease propagated to a fearful extent, by the negligence of the Board of Health in inquiring into the sanitary condition of the houses and localities in which the disease existed.

No epidemic affection demands more prompt action than variola. Every house in which it occurs should be thoroughly inspected by our health authorities, and they should know that all per-

sons suffering from it are carefully isolated, and those exposed to it perfectly revaccinated.

The course adopted by the Board of Health in relation to the reports of cases by physicians effectually prevents this being done, and has thrown the responsibility of protecting the community upon the medical profession, to whom the board has most willingly transferred this duty. "Do the premises need a sanitary inspection?" is one of the questions which appear upon their printed forms for reports. A large proportion of the patients among the poorer classes ask and insist that the physician give a negative reply to this question, and there is reason to fear that the relations which he sustains to the family may too often influence the doctor in his answer. We are at least convinced that the decision of this question should be taken from his hands, and that the Board of Health should obtain its own replies by house-to-house inspection.

The truth is that the board has adopted just those regulations which will incommode them the least, and have thrown off on others as much as possible of the labor which they ought to perform.

Early in February, 1871, various parish authorities in London obtained apparatus for the purpose of disinfecting clothing and other materials at high heat. But the Board of Health of Philadelphia has nothing of the kind, and what becomes of infected clothing and furniture taken from houses in which small-pox patients have passed through the diseases, is a very important question. So far as we are aware, this active organization never troubles itself as to what goes on in habitations containing the disease, providing the attending physician gives to this all important question, "Do the premises need a sanitary inspection?" a negative reply. The love of money makes the owner of a palatial residence hesitate long before he throws away an elegant suite of furniture and a set of handsome carpets. We fear that these too often find their way to an auction room or a second-hand furniture dealer. True, by *applying* to the Board of Health they can obtain the favor of having these infected goods removed, and appropriated by the city for its own use, upon the payment of a certain sum. As much trouble and expense as possible is given the public before they can feel that their houses are disinfected, and their friends can enter them in safety.

If these arguments apply to the cases of the disease among the wealthy, they can be much more forcibly urged in regard to those which occur among the laboring classes. To these everything is valuable, and that the poor man whose house has been furnished from the "sweat of his brow" should attempt to hide a case of the disease occurring in his house, is not surprising. The only advantage that he can derive from his poverty is that his infected clothing and furniture—it may be all that he has—will be hauled away for nothing; truly a privilege for which he should be thankful.

A physician seeing a mild case of variola among this class may most truthfully say, in his report to the Board of Health, that the patient need not be removed to the hospital, and that the premises do not need sanitary inspection, and the patient may be so slightly ill that he may never see him again. These people do not possess sufficient information, and have not the means to thoroughly disinfect their houses, furniture and clothing, and thus the disease is propagated from individual to individual, so that the epidemic may be indefinitely prolonged.

This board, so far as we know, has done all that it can, with the laws as they now exist in regard to vaccination. They have issued resolutions to the public, codes of regulations to their vaccine physicians, and have appointed a number of the latter in addition to those who were upon duty when the disease appeared in our midst. On paper they appear well; but, so far as active work is concerned, so far as house-to-house inspection is concerned, so far as sanitary improvements and disinfection are demanded, they have manifested a most alarming apathy. In this it must be confessed they have been supported by the public press and commercial authorities, a fact, however, which does not make their negligence the less culpable. The result has been that, in the short space of four and a half months, 2,086 persons have died from the disease, a mortality equal to about 11,000 in London—more, in proportion to our population, than occurred in that city from October, 1870, to January, 1872; and, unless something is done, and that speedily, to arrest the progress of the epidemic, it may be prolonged, as in the latter city, for more than a year. If it is, and the death rate continues as high, in proportion to our population, as it is now, the numbers destroyed will actually exceed those of the British metropolis.

That the progress of the epidemic may be arrested is beyond doubt. With a proper degree of energy on the part of our authorities, and some modifications of the laws in regard to vaccination, the disease may be banished from our midst. Three measures are all important, and these are: 1. Complete and thorough isolation of persons infected by the disease. 2. Perfect disinfection of the houses and effects of those under the direction of the Board of Health. 3. Systematic vaccination and revaccination, which should be made compulsory.

It is true that these measures would meet with much opposition from some persons in the community, but the important interests at stake demand that individual prejudices and personal privileges, be sacrificed for the general good. It is time for the thinking and educated portion of the community to unite to obtain some legislative action that will do something to protect the public from epidemics like this one.

That this is true is proved by the fact that the mortality from this disease in Philadelphia during the past three months is but little less than one-fourth what it was in London during the whole of last year.

This is the plain unvarnished truth in regard to the variola epidemic of Philadelphia in 1871—an epidemic which had nothing “alarming” in it—about which, according to the public papers and our city officials, nothing must be said or done for fear of creating a panic and driving business away from the city.

For this morbid public confidence we have truly paid a fearful price in the several thousand precious lives which have been claimed for the sacrifice, and now, to-night, there are in this city thousands of broken home circles, and from thousands of firesides there are going up to the court of the Omnipotent the mournful wail of tens of thousands who have been bereaved. And even yet the destroyer has not finished his dreadful work. About the city, at odd hours and in devious neglected streets, funerals without followers are wending their way silent and unheeded to the cities of the dead. And even now, not only in narrow courts and dark alleys, not only in the homes of the poor where the air is loaded with the poisons of filth and over-crowding, but still more along our widest thoroughfares, in the palatial mansions of the wealthy, where the air is filled with rich perfumes, and the sufferer is tended

by careful hands, the touch of which is made more tender by the untold love of aching hearts, men, and women, and children too, are tossing in the unspeakable agony of the terrible fever.

All this is going on when hundreds of thousands of dollars of the public money are being squandered by defaulting city officials, being jeopardized in unsafe National banks, while some of our legislators are under heavy bonds for the good conduct of the former, and others are managing the financial affairs of the latter. This while in our council chambers was progressing a lively discussion as to whether or not the paltry appropriation asked for by the Board of Health should be granted. For this delay you and I have been living and breathing, in an atmosphere surcharged with one of the subtlest of all poisons. For this false security, and this niggardly tribute to mammon, made at the dictation of commercial and political authorities, and which was sinful beyond human language to express, we have paid the incalculable price of some thousand human lives. Truly it is time for the community to rise in its majesty and might, and with a voice as from one man to call these to their fearful reckoning.

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